



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
-----------------	-------------	----------------------	---------------------	------------------

09/544,762

04/07/2000

Shannon Mary Nelson

NORTH-390A/A-2241

9968

7590

05/19/2004

Terry J Anderson Esq
Northrop Grumman Corporation
1840 Century Park East
Los Angeles, CA 92677-2199

EXAMINER

SEDIGHIAN, REZA

ART UNIT

PAPER NUMBER

2633

19

DATE MAILED: 05/19/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/544,762

Applicant(s)

NELSON ET AL.

Examiner

M. R. Sedighian

Art Unit

2633

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 30 December 2003.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-6,8-13,15 and 16 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-6,8-13,15 and 16 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other:

Art Unit: 2633

1. This communication is responsive to applicant's 12/30/2003 amendments in the application of Shannon Mary Nelson et al. for "Rugged shock resistant backplane for embedded systems" filed 4/7/2000. The amendments have been entered. Claims 1-6, 8-13, and 15-16 are now pending.

2. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

3. Claims 1-6 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

As to claim 1, it recites the limitation "said receiver photodiodes" in line 13, and "said circuits" in line 17. There are insufficient antecedent basis for these limitation in the claim.

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claims 1-2, 6, 8-9, 13, and 15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ahmad et al. (US patent No: 5,818,984) in view of Davidson (US patent No: 6,160,653) and in further view of William (US patent No: 3,858,154).

Regarding claims 1, as it is understood in view of the above 112 problem, and claims 8 and 15, Ahmad discloses a shock-resistant system (10, fig. 1 and 32, fig. 4) for interconnecting

Art Unit: 2633

circuit cards (14g, 14h, fig. 1 and 34, fig. 4) to enable data to be transmitted and received therebetween (col. 3, lines 40-42, col. 5, lines 24-27), comprising: a common backplane (12, fig. 1 and 38, fig. 4) having a plurality of circuit card connectors (col. 3, lines 53-59 and 15, fig. 2) disposed in spaced apart relation thereon for supporting circuit cards in a generally upright parallel relationship (chips 14a-i are arranged in a parallel relationship with respect to each other); a plurality of circuit cards (14g, 14h, fig. 1 and 34, 36, fig. 4) each being mounted to one of the circuit card connectors (col. 3, lines 55-58) and having a transmitter LED (20a, fig. 3A) and a receiver photodiode formed thereon (22b, fig. 3A); a plurality of optical pathways (25, fig. 2 and 24, fig. 3A) formed solely through air between the circuit cards (col. 4, lines 10-15), the optical pathways forming a plurality of independent optical connections (note that there are a plurality of optical path ways 24 between transmitters 20a, 20c, 20e of circuit card 14g and the optical receivers 22a, 22c, 22e of the circuit card 14h) between the transmitter LED (20a, fig. 3A) on at least one of the circuit cards (14g, fig. 3A) and the receiver photodiode (22a, fig. 4) on the other circuit cards (14h, fig. 3A and col. 4, lines 15-20); and wherein the circuit cards (14g, 14h, fig. 3A) are maintained in fixed relationship to one another via the common backplane (12, fig. 3A) to maintain continuous optical intercard communications between each of the circuit cards such that the LED on each circuit card is operative to generate and transmit a signal and the photodiode of one corresponding circuit card is operative to receive the signal through the corresponding optical pathway (col. 4, lines 15-21). Ahmad differs from the claimed invention in that Ahmad does not specifically disclose the interconnected circuit cards are within a computer system. Davidson teaches the interconnection of optical circuit cards (100, 104, fig. 8) within a computer system (col. 12, lines 14-28). One of the ordinary skill in the art would have

Art Unit: 2633

been motivated to incorporate a plurality of interconnected optical circuit cards within a computer system to provide a high speed data communication between the elements of the computer system. As it is taught by Davidson, it would have been obvious to an artisan at the time of invention to incorporate a plurality of interconnected optical circuit cards such as the ones of Ahmad within a computer system to provide a high speed optical data communication between the sub-system elements within a computer to increase the bandwidth. The modified optical data transmission system of Ahmad and Davidson differs from the claimed invention in that Ahmad and Davidson do not specifically disclose circuit cards are extended normal to a back plane. William teaches a common backplane having a plurality of circuit cards connectors disposed in spaced apart relationship for supporting circuit cards extending normal to the backplane (col. 1, lines 21-31 and figs. 1, 6). Therefore, it would have been obvious to a person of ordinary skill in the art at the time of invention to provide a supporting structure, wherein circuit cards are extended normal to a backplane, as it is taught by William, for the circuit cards and the backplane, in the modified optical data transmission system of Ahmad and Davidson in order to transmit the optical signals at a plurality of different paths and different directions. As to claims 8 and 15, Ahmad further teaches generating and transmitting a light from at least one of the LED diode (for example, transmitter 20a in fig. 3A) and receiving the light by the photodiode formed on any of the circuit cards (for example, by receiver 22a that can be considered as a photodiode that is formed on any one of the circuit cards such as circuit card 14h) to receive the data carried by the light (col. 4, lines 4-17).

Regarding claims 2 and 9, Ahmad discloses optically transmitted infrared radiation (col. 3, line 25-27).

Regarding claims 6 and 13, Ahmad discloses the first and second circuit cards are operative to run an embedded application (col. 5, lines 30-33).

6. Claims 3-4 and 10-11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ahmad et al. (US patent No: 5,818,984) in view of Davidson (US patent No: 6,160,653) and in view of William (US patent No: 3,858,154) and in further view of Croft et al. (US Patent No: 5,864,708).

Regarding claims 3-4 and 10-11, the combination of Ahmad, Davidson, and William differs from the claimed invention in that Ahmad, Davidson, and William do not specifically disclose the transmission and reception signals comprise a standardized infrared communication scheme protocol that is developed by the infrared data association. Croft discloses wireless transceivers (63, 64, fig. 1) that communicate with each other by using Infrared Data Association standards (col. 3, lines 5-14). Therefore, it would have been obvious to a person of ordinary skill in the art at the time of invention to incorporate Infrared Data Association standards or protocols such as the one discussed by Croft for the optical data transmission and reception in the modified optical communication systems of Ahmad, Davidson, and William in order to provide a reliable method of data transmission by implementing a standard Infrared protocol to detect transmission errors and to avoid collisions.

7. Claims 5 and 12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ahmad et al. (US patent No: 5,818,984) in view of Davidson (US patent No: 6,160,653) and William (US patent No: 3,858,154) and in further view of Barina (US Patent No: 4,829,596).

Regarding claims 5 and 12, the combination of Ahmad, Davidson, and William differs from the claimed invention in that Ahmad, Davidson, and William do not disclose the first and second circuit cards are housed within an enclosure. Barina discloses a housing (12, fig. 1) which includes a series of slots that receive a plurality of circuit boards (16-18, fig. 1) that are connected to a mother board which extends along the back surface of the housing to a backplane (col. 2, lines 55-61 and 11, fig. 1). It is inherent that electrical or optical components are housed within a housing for the reason of safety and protection, and it would have been obvious to provide an enclosure such as the one Barina for the optical circuit cards in the modified optical communication system of Ahmad, Davidson, and William in order to protect it's components and to provide safety for the users.

8. Claim 16 is rejected under 35 U.S.C. 103(a) as being unpatentable over Ahmad et al. (US patent No: 5,818,984) in view of Davidson (US patent No: 6,160,653) and William (US patent No: 3,858,154) and in further view of Cargin, Jr. et al. (US Patent No: 6,023,147).

Regarding claim 16, the combination of Ahmad, Davidson, and William differs from the claimed invention in that Ahmad, Davidson, and William do not disclose the computer system includes a hand-held data collection device. Cargin discloses a hand-held data collection device (col. 3, lines 55-60 and 10, fig. 1) that includes a plurality of circuit cards (col. 10, lines 22-29). Therefore, it would have been obvious to an artisan at the time of invention to incorporate a plurality of interconnected optical circuit cards such as the ones of Ahmad within a computer system such as of Davidson, or within a data collection device such as of Cargin to provide a

Art Unit: 2633

high speed optical data transmission between sub-system elements of the computer system to increase the bandwidth.

9. Applicant's arguments filed 12/30/2003 have been fully considered but they are not persuasive.

Remark states Ahmad fails to teach a plurality of optical connections between the LED on at least one of the circuit card and the photodiodes on the other circuit cards. However, Ahmad teaches a plurality of optical transmitters 20 on a circuit card 14g that communicate through a plurality of optical pathways 24 with optical receives 22 on another circuit card 14h. Remark further states Ahmad does not disclose infrared signals. Ahmad teaches each optical transmitter of one chip transmits optical signals 24 (col. 4, lines 12-13). Note that optical spectrum generally, the electromagnetic spectrum is within the wavelength region extending from the vacuum ultraviolet at 1 nm to the far infrared at 0.1 mm. Ahmad further teaches the light generated from at least one LED (such as transmitter 20a) is received by the photodiode (such as photodiode 22a) formed on any of the circuit card (such as circuit card 14h). Remark states Ahmad fails to disclose a shock-resistant system. However, it is obvious that electrical or optical components can be housed within a shock-resistant housing for reasons of safety and protection, as such enclosures are taught by Barina. Remark further states Davidson fails to teach the upright relationship of the circuit cards supported by connectors, and fails to teach the optical pathway formed solely through air. However, Davidson is cited to teach circuit cards can be incorporated within a computer system. Remark further states Croft fails to teach wireless communication established between the circuit cards within the computer. Croft is cited to show

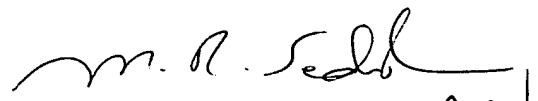
Art Unit: 2633

wireless transceivers (63, 64, fig. 1) that communicate with each other by using Infrared Data Association standards (col. 3, lines 5-14). In response to applicant's arguments against the references individually, one cannot show nonobviousness by attacking references individually where the rejections are based on combinations of references. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981); *In re Merck & Co.*, 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986).

10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to M. R. Sedighian whose telephone number is (703) 308-9063. The examiner can normally be reached on M-F (from 9 AM to 5 PM).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jason Chan can be reached on (703) 305-4729. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).


M.R. SEDIGHIAN
Patent Examiner
Art Unit: 2633